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RESEARCH ARTICLE

Combined Therapy Using Acupressure Therapy, Hypnotherapy, and Transcendental Meditation versus Placebo in Type 2 Diabetes

Roohallah Bay [1,*], Fatemeh Bay [2]

[1] *Department of Family Medicine, University Sains Malaysia (USM), Malaysia*
[2] *International University for Complementary Medicine, Zoroastrian College, Medical Sciences University of Golestan, Iran*

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Abstract
Type 2 diabetes is one of the most widespread diseases in the world. The main aim of this research was to evaluate the effect of combined therapy using acupressure therapy, hypnotherapy, and transcendental meditation (TM) on the blood sugar (BS) level in comparison with placebo in type 2 diabetic patients. We used "convenience sampling" for selection of patients with type 2 diabetes; 20 patients were recruited. For collection of data, we used an identical quasi-experimental design called "nonequivalent control group." Therapy sessions each lasting 60–90 min were carried out on 10 successive days. We prescribed 2 capsules (containing 3 g of wheat flour each) for each member of the placebo group (one for evening and one for morning). Pre-tests, post-tests, and follow-up tests were conducted in a medical laboratory recognized by the Ministry of Health and Medical Education of Iran. Mean BS level in the post-tests and follow-up tests for the experimental group was reduced significantly in comparison with the pre-tests whereas in the placebo group no changes were observed. Combined therapy including acupressure therapy, hypnotherapy, and TM reduced BS of type 2 diabetic patients and was more effective than placebo therapy on this parameter.

1. Introduction

The pancreas (*pan*, all; *kreas*, flesh) is a gland that both exocrine and endocrine. The exocrine part secretes digestive pancreatic juice whereas the endocrine part secretes hormones such as insulin [1]. Insulin is a polypeptide that is secreted by beta-cells in the pancreatic islets of Langerhans [2].

Type 2 Diabetes causes a decrease in the ability to absorb insulin, which is referred to as insulin resistance; the major effect of insulin resistance is disruption of the use of glucose in cells [3].

* Corresponding author: Roohallah Bay, Ph.D., Neuropsychology, Post Doctoral Fellow, Department of Family Medicine, University Sains Malaysia (USM), Malaysia.
E-mail: bay@kk.usm.my (R. Bay).

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Type 2 diabetes accounts for >80—90% of all diabetic patients. Type 2 diabetes is also more severe among older patients because it usually progresses with age; indeed type 2 diabetes was formerly called adult-onset diabetes. Diabetic patients with symptoms must receive great care because they are at risk of severe complications such as heart attack and stroke [3].

According to Gordon [4], cancer patients undergoing meditation reported relief from side effects of radiation and chemotherapy. Williams et al. [5] reported that the current approved treatment for hypertension included transcendental meditation (TM) as a treatment modality. Since the early 1980s, the use of psychotherapy as a treatment modality has grown rapidly, and this has led to better and more complete treatment model [6]. In the present research, we investigated the efficacy of a treatment modality combining acupressure therapy with hypnotherapy and TM, which we called combined therapy, on reducing blood sugar (BS) level of type 2 diabetic patients in comparison with placebo. We also assessed whether variables such as sex, age, and duration of disease influenced the efficacy of combined therapy on BS level. The independent variables were combined therapy and placebo treatment whereas the dependent variable was BS level. The rate of studies, social, economic, and cultural factors, location and environment of therapy, and therapist were control variables; moderator variables were sex, age, and duration of disease.

2. Materials and Methods

2.1. Patients

Our experimental group of type 2 diabetic patients was selected from 252 volunteers who were registered at diabetes clinics of Gorgan Panjomeazar Policlinic (Iran). The patients ranged in age from 25 to 60 years. For data collection, we used quasi-experimental designs called "nonequivalent control group." A placebo group was used as control. Pre-tests were done on both groups before treatment began; post-tests were done after treatment had been completed and follow-up tests were done 2 weeks after the last session.

By paying attention to control and moderator variables and trying to decrease obstructive variables, we invited 49 of the 252 patients for interviews and checkups. At the time of the interviews, we obtained information on the patients' backgrounds, duration of disease, kinds of medicines used, and nutrition with lists of daily meals. Then, according to the research design (unequal control groups), we made an experimental group and one placebo group. Ultimately, from the 49 patients, we placed 20 people in each group while trying to make the two groups similar. Also, according to acupressure therapy principles, we checked physical condition, pulse and tension.

2.2. Treatment methods

We used TM for relaxation, hypnotherapy for relaxation and suggestion, and acupressure therapy for stimulation of nerve cells in the islets of Langerhans in the pancreas.

According to acupuncture, diabetic retinopathy is mainly due to liver weakness. If the liver is activated with acupuncture points, not only does overall digestion improve but also we can avoid diabetic retinopathy. Even if BS level is kept under control side effects may be seen in diabetic patients mainly because of continuous stimulation of the pancreas with tablets. The point is how to bring the digestive system to its optimum level with acupuncture. For a diabetic patient, initially, the spleen point Sp-3 or Sp-6 is stimulated because it controls the pancreas. Along with this, the liver is charged by stimulating Liv-1. Once the liver starts functioning at its optimum level, the pain in any part of the body vanishes, and bowel movement will improve. Along with the liver, the lung point Lu-7 is activated to take care of energy circulation in the body. Finally, the brain meridian and the spleen control point P-7 are activated so that the pancreas starts functioning properly. Since the stimulation mechanism is controlled by one's subconscious mind, self-help techniques such as generating positive thoughts and being sincere may help to overcome diabetes.

2.3. Study design

In this research, we placed male and female patients in both groups because one of the moderator variables of this research was sex. For the setting, we used a room at diabetes clinics of Panjomeazar Policlinic of Golestan Medical Sciences University. For the experimental group we conducted ten 60—90-min meetings on consecutive 10 days whereas placebo group patients received two placebo capsules containing 3 g of wheat flour each per day (one in the morning and one in the evening). We conducted this program for ten sessions and had 1 treatment session every day.

BS level was measured by AccueCheck at a laboratory related to the medical organization of Iran. We provided complete check-ups for the patients 1 day before starting the first session, 1 day after the last session, and 2 weeks after the last session. The tests were done at medical laboratories certified by Golestan Medical Sciences University).

2.4. Statistical analysis

Statistical methods were used at two descriptive and inferential levels. In descriptive statistics, we used the mean, variance, standard deviation (SD), and quarter and charts. In inferential statistics, to compare the data, we used Student's *t*-test and analysis of variance. Because of the small sample size the patients in the groups had to be representative of the general diabetic population and equal in size. To determine whether the groups were representative of the general diabetic population we used Kolmogorov-Smirnov test. To check the equality of variances, we used the Leven Test, and to survey the quality of changes between the pre-test, post-test, and follow-up test we used Duncan test. For the survey on the effects of different variables, as well as the passage of time, and because the tests were done at different times we used the repeated measures method; equality of covariances had to be established, so we used the box test and the covariate

test. For the nonexistent equality of variances, we used Huynh-Feldt, Greenhouse-Geisse, and lower-bound tests. Al statistical analyses were conducted using SPSS software.

3. Results

Pre-test, post-test, and follow-up test BS levels in the placebo and experimental groups were 214, 232, and 238 and 217, 145, and 165 mg/dl, respectively, as shown in Table 1.

Table 1 shows that the BS levels in both groups varied with time. The minimum BS level in both groups occurred at the time of the post-test. At the follow-up test, a slight increase was noted, but was not significant. The pre-test BS level was the highest among the three tests. These results show that combined therapy was able to decrease BS levels of patients Table 2.

Table 3 ($F = 14.68$; $p = 0.001$) indicates different changes in the BS levels of patients at different times. However, when we surveyed each moderator variable individually after deleting the effects of other variables, we observed that all significance levels were >0.05. Thus we could conclude that neither sex nor age of the patient had any significant effect on BS level at different times. Thus the data support both main hypotheses of this research.

4. Discussion

Hypnosis has been successfully used for the treatment of several disorders. In 1996, the US National Institutes of Health (NIH) judged hypnosis helpful for the treatment of pain from cancer and other chronic conditions. Several studies have indicated that it can ameliorate acute pain in burn patients, children experiencing bone marrow aspirations, and women in labor. Hypnosis is also efficacious for analgesia of invasive medical procedures [7].

Meditation's beneficial effects include increased happiness, reduced stress, increased intelligence, increased creativity, improved memory, improved health, reduced high blood pressure, improved relationships, increased energy, reduced insomnia, reversal of biological aging, reduced crime, and improved quality of life in society, as reported in major scientific journals such as *Science*, *American Journal of Physiology*, *Scientific American*, *Lancet*, *Journal of Counseling Psychology*, *International Journal of Neuroscience*, *Journal of the Canadian Medical Association*, *British Journal of Educational Psychology*, and *Journal of Conflict Resolution* [8].

Sommer [9] reported that 2000 regular practitioners of TM, when compared with 600,000 nonmeditators over a 5-year period, had 30.6% fewer mental disorders, 30.4% fewer infectious diseases, and >50% less overall health system usage [9]. Benson [10] conducted a series of investigations involving men and women to examine the effect of TM on physiological functions of the body and reported marked physiological changes including reductions in heart rate, breathing rate, oxygen consumption, blood lactate, and blood pressure [10].

Researchers at New Mexico State University's Social Work Department (now the School of Social Work) observed a high incidence of diabetes among Mexican-Americans in southern New Mexico. They believed that the use of a short relaxation program could have beneficial effects on the health of those with diabetes and their families. They found that a combination of acupressure and breath awareness helped people with diabetes. The study showed that a short stress-relief program including touch could lower blood sugar and improve health in diabetic patients [11].

According to Redfield [12], more people are discovering relaxation methods and find a sense of comfort and well being through the practice of meditation. Currently, many people integrate meditation in their programs for health promotion and illness prevention. Meditation, as a method to integrate the concept of mind and body, has been recorded as effective for many centuries in the form of either practical or religious practices. The procedure of

Table 1 BS levels (mg/dl) at different times for men and women in the two groups

	Group	Gender	Mean	Std. Deviation
BS 1 (pre-test)	Experiment	Male	185.2000	24.13918
		Female	250.6000	66.13471
		Total	217.9000	58.23220
	Placebo	Male	192.2000	29.13246
		Female	236.4000	49.84777
		Total	214.3000	44.99148
BS 2 (post-test)	Experiment	Male	121.6000	14.97665
		Female	168.4000	75.79776
		Total	145.0000	57.11003
	Placebo	Male	208.8000	42.28120
		Female	255.8000	55.44096
		Total	232.3000	52.67099
BS 3 (follow−up)	Experiment	Male	149.8000	47.44154
		Female	180.4000	57.53955
		Total	165.1000	52.26737
	Placebo	Male	211.0000	47.08503
		Female	265.0000	58.88124
		Total	238.0000	57.76004

Table 2 BS levels between groups and within groups

	df	F	*p*-value
Between groups	2	4.532	.020
Within groups	27		
Total	29		

Table 3 Factors and moderator variables

Source	Test	df	F	*p*-value
Time	Greenhouse-Geisser	1.319	2.114	.160
Group	Greenhouse-Geisser	1.319	14.685	.001
Sex	Greenhouse-Geisser	1.319	.146	.776
Age	Greenhouse-Geisser	1.319	1.677	.215
Duration of disease	Greenhouse-Geisser	1.319	.360	.615

meditation involves the concept of inner stillness and celebrates nature as a revered path to self-knowledge and spiritual enlightenment, leading the person on a satisfying mental journey. The goal of meditation is to empty the mind of thought and let go of the preoccupations that make up the mind's chatter [12].

According to Bricklin [13] approximately 40% of the US population uses alternative therapies. As popular interest in alternative medicine has increased, so has advanced practical nurse involvement, research attention, and the likelihood of insurance reimbursement. Approximately 35% of all family medicine departments offer some kind of instruction in alternative therapies. Research interest in alternative therapies at NIH is growing. The Organization of Alternative Medicine (OAM) has recently funded a study of alternative therapies at several academic centers including, among others, Harvard, Stanford, and Columbia medical schools. Meanwhile, managed care organizations and insurance companies including Mutual of Omaha, Blue Cross/Blue Shield of Washington and Alaska, and US Health Care, are offering special health plans that include alternative therapies [13].

Our study showed different results for the experimental and placebo groups. Combined therapy had a more significant effect than placebo on reducing BS independent of sex, age, and duration of disease. Thus our study supports a link between alternative healing therapies and improvement of type 2 diabetes. This creates an argument for structured programs teaching lifestyle change, nonpharmacologic interventions, and alternative therapies in conjunction with conventional treatment. Alternative therapies can be extremely useful adjuncts to conventional care, and sometimes provide the most appropriate option for hard-to-treat conditions such as diabetes, hypertension, chronic headaches, and insomnia [14].

If lifestyle changes and alternative healing such as hypnotherapy, TM, and acupressure therapy are taught to patients, the risk of stroke, heart attack, and other disabling complications of diabetes and most other diseases will decrease. Pharmacologic treatment is an area of expertise that requires special attention in the type 2 diabetes population. However, there can be adverse side effects with medication. By implementing holistic healing classes, the therapist can give patients the foundation to reduce stress in their lives, thereby reducing the need for conventional medical treatment. Therapists can also experience both the benefits and the limitations of these approaches and find ways optimally to use them with their patients. By embarking on these extended courses of study, the clinical results may justify the investment of time and energy [15].

The findings of our study have implications for advanced psychological practice, education, and health care of diabetic patients and for others with disease states. Implementation of hypnotherapy, acupressure therapy, and TM classes taught by psycho-physiologists in outpatient clinics should be considered at patients' first clinic visit. A shift in emphasis from treating to teaching highlights the psychological function as a guide and teacher and makes patient care a more fulfilling partnership. Psychologists should have knowledge of holistic healing and implementation of hypnotherapy, TM, and acupressure therapy as classes in schools of psychology introduce the concept of alternative healing therapies [14].

Our study has raised questions and impacted other areas. Alternative and combined therapies suggest a wider vision of what medicine can and should be through appreciation of the interconnectedness of mind and body, emphasis on enhancing the body's own capacity for healing, and the application of all the world's healing traditions. Alternative therapies can be used as an adjunct to treat all disease states of the mind and body. It is entirely possible that in less than a generation, the approach and techniques currently called "alternative" will be an integral part of the practice of neuropsychology and psychology practitioners everywhere.

Our study suggests that combined psycho-physiological therapy (acupressure therapy, hypnotherapy, and TM) may be important in type 2 diabetic patient populations. Integration of acupressure therapy, hypnotherapy, and TM in treatment plans allows collaborative and democratic relations among advanced psycho-physiological practitioners, other health care providers, and patients, who then reap the psychological and physiological rewards of feeling more in control of their own lives and welfare.

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